

1 scheme based on the assumption that the demodulated complex symbols are associated to respectively transmitted symbols via a rotational symmetric constellation diagram so that approximative estimations for the phase-shift lead to applications with reasonable results.

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For multi-amplitude signals such as QAM (Quadrature Amplitude Modulation) only coherent modulation is used, and thus channel estimation is always required (see e.g. EP 0 734 132 A2).

10 It is an object of the present invention to teach a more simple modulation/demodulation method and system for multi-amplitude digital modulated signals with non-equidistant phases, in particular QAM signals transmitted via an OFDM communication channel without the necessity of using pilot carriers.

15 According to the teaching and the characterizing features of claim 1, this problem is solved with the idea that the amplitudes of said digital modulated signals should be separately and coherently processed, whereas for the phases of respectively subsequent symbols on the same subcarrier differential modulation and demodulation is provided.

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Advantageous details, improvements and embodiments are the subject of dependent claims.

An orthogonal frequency division multiplexing (OFDM) system for the transmission of information by multi-amplitude digital modulated signals from a transmitter to a receiver via a radio channel in accordance with the invention  
25 is the subject-matter of and defined in ~~claim 9~~ <sup>the independent claims</sup>. Specific embodiments and advantageous supplements and improvements are defined in further dependent claims.

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For a comprehensive explanation of the invention the following description is devided in chapters.

In Chapter I the OFDM transmission model used for simulations and the  
35 channel models are first described.